

CLAIMS 08/919,947



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81. A refrigerated display case comprising:
- a frame element;
 - at least one door supported relative to the frame element;
 - an electronic ballast mounted adjacent the frame for operating at a frequency above 100 cycles per second and above 200 volts;
 - at least one lamp socket supported relative to the frame and having socket contacts for supplying electrical energy to a lamp having cylindrical contacts through the socket contacts, wherein the socket contacts have a surface area available for electrical contact of at least 0.008 square inch;
 - at least one electrical conductor for electrically coupling the ballast to the socket, wherein the conductor has a surface area available for electrical contact of at least 0.008 square inch; and
 - a junction between the at least one electrical conductor and the contacts of the at least one lamp socket for forming an electrical bridge between the at least one electrical conductor and the contacts wherein the bridge has a surface area available for electrical contact of at least 0.008 square inch.
82. The display case of claim 81 wherein the contacts for the at least one lamp socket are at least partially cylindrical for accepting a pin for electrical contact.
83. The display case of claim 81 wherein the contacts for the at least one lamp socket have an arcuate shape over a substantial surface area for contact with a mating electrical contact.
84. The display case of claim 81 wherein the contact of the at least one lamp socket is adapted to contact with a mating contact through a longitudinal connection movement.

85. The display case of claim 81 wherein the contacts for the at least one lamp socket are at least partially hollow cylindrical for accepting a complimentary pin contact, wherein the at least one electrical conductor includes wire having a size no smaller than 16 gauge, and wherein the junction includes a connector having a pin connector portion and a complementary mating hollow cylindrical connecting portion, and further including a lamp with pins electrically contacting the contacts on the at least one lamp socket.

86. The combination of claim 85 wherein the contacts of the at least one lamp socket engage the lamp pins over at least 180 degrees of the circumferential surface of the lamp pins.

87. The display case of claim 86 wherein the contacts on the at least one lamp socket engage the pins on the lamp over at least 50 per cent of the length of the pins on the lamp.

88. The display case of claim 81 further including a fluorescent lamp connected to two lamp sockets, wherein each lamp socket includes hollow cylindrical contacts for engaging pins on the lamp.

89. The display case of claim 81 further comprising a first electrical conductor for supplying electrical energy to a first contact in the at least one lamp socket, a second electrical conductor for supplying electrical energy to a second contact in the at least one lamp socket, and wherein the first conductor is soldered to the first contact and wherein the second conductor is soldered to the second contact.

90. The display case of claim 81 wherein the junction includes at least one pin connector and at least one mating hollow cylindrical connector and wherein the connectors are enclosed in a plastic housing.

91. The display case of claim 81 wherein the contacts for the at least one lamp socket are substantially circular in cross section.

92. The display case of claim 91 wherein the contacts are split sleeve contacts.

93. The display case of claim 81 further including a ballast capable of operating at temperatures below zero degrees Fahrenheit.

94. The display case of claim 81 further comprising a lamp coupled to the at least one lamp socket, wherein the lamp is a fluorescent light source and wherein the at least one socket contact for the fluorescent lamp includes a surface area for contacting a contact on the fluorescent lamp having at least 0.01 square inch surface area available for electrical contact with the contact on the fluorescent lamp.

95. The display case of claim 94 wherein the surface area available for electrical contact with the lamp is at least 0.05 square inch.

96. The display case of claim 94 wherein the electrical circuit is formed in such a way that the surface area available for electrical contact with the lamp is approximately 0.07 square inch.

97. The display case of claim 81 wherein the at least one electrical conductor for electrically coupling the ballast to the socket includes a connection for connecting to a conductor carrying electrical energy from a ballast wherein the junction includes pin conductors engaging hollow cylindrical mating conductors surrounded by plastic.

98. The display case of claim 97 wherein the at least one electrical conductor for electrically coupling the ballast to the socket is connected to a junction formed from a plastic enclosed pin conductor engaging a hollow cylindrical conductor.

99. The display case of claim 97 wherein the at least one electrical conductor for electrically coupling the ballast to the socket is no smaller than 16 gauge wire.

100. A refrigerated display case comprising:

a frame for defining an area to be refrigerated;

at least one product support within the area to be refrigerated, the product support positioned within the area to be refrigerated so that at least part of any product supported on the support can be seen from outside the refrigerated display case;

a light source supported relative to the frame so as to illuminate product on the product support, the light source including cylindrical contacts;

at least one socket for the light source supported relative to the frame and having socket contacts for supplying electrical energy to the light source through the cylindrical contacts and the socket contacts, wherein the socket contacts have a surface area available for electrical contact of at least 0.008 square inch;

a conductor for carrying current wherein the conductor has a surface area available for electrical contact of at least 0.008 square inch;

a ballast electrically coupled to the conductor, the ballast configured for operating at a frequency above 100 cycles per second and above 200 volts; and

a releasable junction between the at least one electrical conductor and the contacts of the at least one socket for forming an electrical bridge between the at least one electrical conductor and the contacts wherein the bridge has a surface area available for electrical contact of at least 0.008 square inch.

101. The display case of claim 100 wherein the light source is supported by a support mounted to the frame.

102. The display case of claim 101 wherein the support is a mullion and wherein the light source is releasably fixed to the mullion.

103. The display case of claim 102 wherein the ballast is supported by the mullion.

104. The display case of claim 103 wherein the conductor for carrying current extends within the mullion.

105. The display case of claim 103 wherein the releasable junction is positioned on the same side of the mullion as the light source.

106. The display case of claim 101 wherein the releasable junction has one portion that is integral with the at least one socket.

107. The display case of claim 101 wherein the releasable junction includes a housing surrounding a portion of the at least one electrical conductor.

108. The display case of claim 107 wherein the at least one socket includes a connector coupled to at least one socket contact and wherein the socket includes a connector housing surrounding a portion of the connector for engaging the housing on the releasable junction.

109. No claim.

110. The display case of claim 100 wherein the ballast is supported by the frame and wherein the at least one light source is also mounted to the frame and wherein the conductor extends from the ballast along a first part of the frame and through an opening in the frame to the at least one socket.

111. The display case of claim 110 wherein the opening is adjacent the at least one socket.

112. The display case of claim 100 wherein the releasable junction includes a cylindrical pin and a mating cylindrical sleeve.

113. The display case of claim 112 wherein the pin and sleeve make electrical contact over at least 180 degrees of circumference around the cylindrical pin.

114. The display case of claim 100 wherein the conductor is a frame conductor and further comprising a ballast connector for connecting a ballast conductor to the frame conductor,

and wherein the ballast connector has a surface area available for electrical contact of at least 0.008 square inch.

115. The display case of claim 114 wherein the ballast connector, the releasable junction, the frame conductor and the at least one socket each have surface areas of contact available for electrical contact of at least 0.05 square inch.

116. The display case of claim 100 wherein the at least one socket has socket contacts having a circumference and wherein the at least one socket includes an insulating portion encircling the circumference of the socket contacts.

117. The display case of claim 116 wherein the socket contacts have respective lengths and wherein the insulating portion has a length greater than the lengths of the socket contacts.

118. A refrigerated display case comprising:
a frame defining a refrigerated enclosure;
at least one door movably supported by the frame for closing an opening in the frame and for allowing selective access to the refrigerated enclosure;
at least one product support within the refrigerated enclosure on the product support can be seen from outside the display case;
a lamp having first and second ends supported by the frame to illuminate product on the product support;
a first socket on a first end of the lamp for providing electrical energy to the lamp, wherein the first socket includes socket contacts having a surface area available for electrical contact of at least 0.05 square inch;
a second socket on the second end of the lamp for providing electrical energy to the lamp, wherein the second socket includes socket contacts having a surface area available for electrical contact of at least 0.05 square inch;
a frame conductor for carrying current wherein the frame conductor has a surface area available for electrical contact of at least 0.05 square inch;

a ballast electrically coupled to the frame conductor and configured for operating at a frequency above 100 cycles per second and above 200 volts; and

a releasable junction between the at least one frame conductor and the first socket contacts for forming an electrical bridge between the at least one frame conductor and the first socket contacts wherein the bridge has a surface area available for electrical contact of at least 0.05 square inch.